Countermeasures for Lunar Explorers

In this suggested literature research activity, students will investigate countermeasures that could be used for astronauts that explore the Moon.

Objectives:

- Describe several countermeasures either currently being used or investigated by NASA.
- Design an experiment to determine what types of shielding are effective against radiation.
- Describe the use of antioxidants to prevent damage from radiation.
- Design a shielding substance that can withstand the effects of radiation while minimizing secondary effects from the collision with matter.
- Explain why understanding solar activity is important to lunar explorers.
- Discuss several drugs that could possibly be used by astronauts as radioprotectants.

Research Question:

Within the context of available countermeasures, how can the astronauts be best protected from over-exposure to radiation while living on the moon for extended periods?

Discussion Questions:

- What time of the day would be best to perform a spacewalk on the surface of the moon? What role would space weather play in your determination?
- How long could explorers be on the surface of the Moon without exceeding their lifetime radiation limits?
- What kind of foods should Astronauts take with them to the Moon?
- Should radiation treatment drugs be taken on long duration missions?
- Why must people be shielded from radiation on the Moon?
- How long is the lunar day? How long is the lunar night?
- What is the chemical composition of lunar regolith? How can it be used in radiation shielding?

References:

http://vesuvius.jsc.nasa.gov/er/seh/gotomoon.html
http://www.chemicalland21.com/info/RADIATION%20PROTECTANTS.htm